- 1 -

SEQUENCE LISTING

<110>  AstraZeneca AB

5  <120>  Molecules

<130>  CCH/100852

<150>  GB 0306185
10 <151>  2003-03-19

<160>  1

<170>  PatentIn version 3.2
15
<210>  1
<211>  2986
<212>  DNA
<213>  Homo sapiens
20
<400>  1
ctgaaaacag aagatagaga ggagtctcgg agctcgccat ctccagcgat ctctacattg    60
ggaaaaaaca tggagtcagc tccggcagcc cccgaccccg ccgccagcga gccaggcagc   120
agcggcgcgg acgcggccgc cggctccagg gagaccccgc tgaaccagga atccgcccgc   180
aagagcgagc cgcctgcccc ggtgcgcaga cagagctatt ccagcaccag cagagatgat   240
gacttttttc atgaactccc agaaactttt ccttctgatc cacctgagcc tctgccacat   300
ttccttattg agcctgaaga agcttatatt gtgaagaata agcctgtgaa cctgtactgt   360
aaagcaagcc ctgccaccca gatctatttc aagtgtaata gtgaatgggt tcatcagaag   420
gaccacatag tagatgaaag agtagatgaa acttccggtc tcattgtccg ggaagtgagc   480
attgagattt cgcgccagca agtggaagaa ctctttggac ctgaagatta ctggtgccag   540
tgtgtggcct ggagctccgc gggtaccaca aagagccgga aggcgtatgt gcgcattgca   600
tatctacgga agacatttga gcaggaaccc ctaggaaagg aagtgtcttt ggaacaggaa   660
gtcttactcc agtgtcgacc acctgaaggg atcccagtgg ctgaggtgga atggttgaaa   720
aatgaagaca taattgatcc cgttgaagat cggaattttt atattactat tgatcacaac   780
ctcatcataa agcaggcccg actctctgat actgcaaatt acacctgtgt tgccaaaaac   840
attgttgcca agaggaaaag tacaactgcc actgtcatag tctatgtcaa cggtggctgg   900
tccacctgga cggagtggtc tgtgtgtaac agccgctgtg acgagggta tcagaaacgt   960
acaaggactt gtaccaaccc ggcaccactc aatgggggtg ccttctgtga agggcagagt  1020
gtgcagaaaa tagcctgtac tacgttatgc ccagtggatg gcaggtggac gccatggagc  1080
aagtggtcta cttgtggaac tgagtgcacc cactggcgca ggaggggagtg cacggcgcca  1140
gcccccaaga atggaggcaa ggactgcgac ggcctcgtct tgcaatccaa gaactgcact  1200
gatgggcttt gcatgcagag tttcatttat cccatttcaa ctgaacagag aacccagaat  1260
gaatatggat tttcttctgc tcctgattca gatgatgttg ctctctatgt tgggattgtg  1320
atagcagtga tcgtttgcct ggcgatctct gtagttgtgg ccttgtttgt gtatcggaag  1380
aatcatcgtg actttgagtc agatattatt gactcttcgg cactcaatgg gggctttcag  1440
cctgtgaaca tcaaggcagc aagacaagat ctgctggctg tacccccaga cctcacgtca  1500
gctgcagcca tgtacagagg acctgtctat gccctgcatg acgtctcaga caaaatccca  1560
atgaccaact ctccaattct ggatccactg cccaacctga aaatcaaagt gtacaacacc  1620
tcaggtgctg tcacccccca agatgacctc tctgagttta cgtccaagct gtcccctcag  1680
atgacccagt cgttgttgga gaatgaagcc ctcagcctga gaaccagag tctagcaagg  1740
cagactgatc catcctgtac cgcatttggc agcttcaact cactgggagg tcaccttatt  1800
gttcccaatt caggagtcag cttgctgatt cccgctgggg ccattcccca agggagagtc  1860
tacgaaatgt atgtgactgt acacaggaaa gaaactatga ggccacccat ggatgactct  1920
cagacacttt tgaccccctgt ggtgagctgt gggcccccag gagctctgct cacccgcccc  1980
gtcgtcctca ctatgcatca ctgcgcagac cccaataccg aggactggaa aatactgctc  2040
aagaaccagg cagcacaggg acagtgggag gatgtggtgg tggtcgggga ggaaaacttc  2100
accaccccct gctacattca gctggatgca gaggcctgcc acatcctcac agagaacctc  2160
agcacctacg ccctggtagg acattccacc accaaagcgg ctgcaaagcg cctcaagctg  2220
gccatctttg ggcccctgtg ctgctcctcg ctggagtaca gcatccgagt ctactgtctg  2280
gatgacaccc aggatgccct gaaggaaatt ttacatcttg agagacagac gggaggacag  2340
ctcctagaag aacctaaggc tcttcatttt aaaggcagca cccacaacct gcgcctgtca  2400
attcacgata tcgcccattc cctctggaag agcaaattgc tggctaaata tcaggaaatt  2460
ccattttacc atgtttggag tggatctcaa agaaacctgc actgcacctt cactctggaa  2520
agatttagcc tgaacacagt ggagctggtt tgcaaactct gtgtgcggca ggtggaagga  2580
gaagggcaga tcttccagct caactgcacc gtgtcagagg aacctactgg catcgatttg  2640
ccgctgctgg atcctgcgaa caccatcacc acggtcacgg ggcccagtgc tttcagcatc  2700
cctctcccta tccggcagaa gctctgtagc agcctggatg ccccccagac gagaggccat  2760
gactggagga tgctggccca taagctgaac ctggacaggt acttgaatta ctttgccacc  2820

- 2 -

```
aaatccagcc caactggcgt aatcctggat ctttgggaag cacagaactt cccagatgga    2880
aacctgagca tgctggcagc tgtcttggaa gaaatgggaa gacatgaaac ggtggtgtcc    2940
ttagcagcag aagggcagta ttaaccacca tgctggaagg ggaaat                   2986
```

5

<210> 2
<211> 964
<212> PRT
<213> Homo sapiens

10

<400> 2

| Met Glu Ser Ala Pro Ala Ala Pro Asp Pro Ala Ala Ser Glu Pro Gly |
| 1               5                   10                  15 |

15

| Ser Ser Gly Ala Asp Ala Ala Ala Gly Ser Arg Glu Thr Pro Leu Asn |
|             20                  25                  30 |

| Gln Glu Ser Ala Arg Lys Ser Glu Pro Pro Ala Pro Val Arg Arg Gln |
|             35                  40                  45 |

20

| Ser Tyr Ser Ser Thr Ser Arg Asp Asp Asp Phe Phe His Glu Leu Pro |
|     50                  55                  60 |

| Glu Thr Phe Pro Ser Asp Pro Pro Glu Pro Leu Pro His Phe Leu Ile |
| 65                  70                  75                  80 |

25

| Glu Pro Glu Glu Ala Tyr Ile Val Lys Asn Lys Pro Val Asn Leu Tyr |
|                 85                  90                  95 |

| Cys Lys Ala Ser Pro Ala Thr Gln Ile Tyr Phe Lys Cys Asn Ser Glu |
|             100                 105                 110 |

30

| Trp Val His Gln Lys Asp His Ile Val Asp Glu Arg Val Asp Glu Thr |
|             115                 120                 125 |

| Ser Gly Leu Ile Val Arg Glu Val Ser Ile Glu Ile Ser Arg Gln Gln |
|             130                 135                 140 |

35

| Val Glu Glu Leu Phe Gly Pro Glu Asp Tyr Trp Cys Gln Cys Val Ala |
| 145                 150                 155                 160 |

40

| Trp Ser Ser Ala Gly Thr Thr Lys Ser Arg Lys Ala Tyr Val Arg Ile |
|             165                 170                 175 |

| Ala Tyr Leu Arg Lys Thr Phe Glu Gln Glu Pro Leu Gly Lys Glu Val |
|             180                 185                 190 |

45

| Ser Leu Glu Gln Glu Val Leu Leu Gln Cys Arg Pro Pro Glu Gly Ile |
|             195                 200                 205 |

50

| Pro Val Ala Glu Val Glu Trp Leu Lys Asn Glu Asp Ile Ile Asp Pro |
|     210                 215                 220 |

| Val Glu Asp Arg Asn Phe Tyr Ile Thr Ile Asp His Asn Leu Ile Ile |
| 225                 230                 235                 240 |

55

| Lys Gln Ala Arg Leu Ser Asp Thr Ala Asn Tyr Thr Cys Val Ala Lys |
|             245                 250                 255 |

| Asn Ile Val Ala Lys Arg Lys Ser Thr Thr Ala Thr Val Ile Val Tyr |
|             260                 265                 270 |

60

| Val Asn Gly Gly Trp Ser Thr Trp Thr Glu Trp Ser Val Cys Asn Ser |
|             275                 280                 285 |

65

| Arg Cys Gly Arg Gly Tyr Gln Lys Arg Thr Arg Thr Cys Thr Asn Pro |
|             290                 295                 300 |
```

```
       Ala Pro Leu Asn Gly Gly Ala Phe Cys Glu Gly Gln Ser Val Gln Lys
       305                 310                 315                 320

    5  Ile Ala Cys Thr Thr Leu Cys Pro Val Asp Gly Arg Trp Thr Pro Trp
                       325                 330                 335

       Ser Lys Trp Ser Thr Cys Gly Thr Glu Cys Thr His Trp Arg Arg Arg
                       340                 345                 350

   10  Glu Cys Thr Ala Pro Ala Pro Lys Asn Gly Gly Lys Asp Cys Asp Gly
                   355                 360                 365

       Leu Val Leu Gln Ser Lys Asn Cys Thr Asp Gly Leu Cys Met Gln Ser
                   370                 375                 380
   15
       Phe Ile Tyr Pro Ile Ser Thr Glu Gln Arg Thr Gln Asn Glu Tyr Gly
       385                 390                 395                 400

   20  Phe Ser Ser Ala Pro Asp Ser Asp Asp Val Ala Leu Tyr Val Gly Ile
                   405                 410                 415

       Val Ile Ala Val Ile Val Cys Leu Ala Ile Ser Val Val Val Ala Leu
                   420                 425                 430

   25  Phe Val Tyr Arg Lys Asn His Arg Asp Phe Glu Ser Asp Ile Ile Asp
                   435                 440                 445

       Ser Ser Ala Leu Asn Gly Gly Phe Gln Pro Val Asn Ile Lys Ala Ala
           450                 455                 460
   30
       Arg Gln Asp Leu Leu Ala Val Pro Pro Asp Leu Thr Ser Ala Ala Ala
       465                 470                 475                 480

   35  Met Tyr Arg Gly Pro Val Tyr Ala Leu His Asp Val Ser Asp Lys Ile
                   485                 490                 495

       Pro Met Thr Asn Ser Pro Ile Leu Asp Pro Leu Pro Asn Leu Lys Ile
                   500                 505                 510

   40  Lys Val Tyr Asn Thr Ser Gly Ala Val Thr Pro Gln Asp Asp Leu Ser
               515                 520                 525

       Glu Phe Thr Ser Lys Leu Ser Pro Gln Met Thr Gln Ser Leu Leu Glu
           530                 535                 540
   45
       Asn Glu Ala Leu Ser Leu Lys Asn Gln Ser Leu Ala Arg Gln Thr Asp
       545                 550                 555                 560

   50  Pro Ser Cys Thr Ala Phe Gly Ser Phe Asn Ser Leu Gly Gly His Leu
                   565                 570                 575

       Ile Val Pro Asn Ser Gly Val Ser Leu Leu Ile Pro Ala Gly Ala Ile
                   580                 585                 590

   55  Pro Gln Gly Arg Val Tyr Glu Met Tyr Val Thr Val His Arg Lys Glu
                   595                 600                 605

       Thr Met Arg Pro Pro Met Asp Asp Ser Gln Thr Leu Leu Thr Pro Val
           610                 615                 620
   60
       Val Ser Cys Gly Pro Pro Gly Ala Leu Leu Thr Arg Pro Val Val Leu
       625                 630                 635                 640

   65  Thr Met His His Cys Ala Asp Pro Asn Thr Glu Asp Trp Lys Ile Leu
                   645                 650                 655

       Leu Lys Asn Gln Ala Ala Gln Gly Gln Trp Glu Asp Val Val Val Val
                   660                 665                 670
```

```
      Gly Glu Glu Asn Phe Thr Thr Pro Cys Tyr Ile Gln Leu Asp Ala Glu
          675                 680                 685

  5   Ala Cys His Ile Leu Thr Glu Asn Leu Ser Thr Tyr Ala Leu Val Gly
          690                 695                 700

      His Ser Thr Thr Lys Ala Ala Ala Lys Arg Leu Lys Leu Ala Ile Phe
      705                 710                 715                 720
 10
      Gly Pro Leu Cys Cys Ser Ser Leu Glu Tyr Ser Ile Arg Val Tyr Cys
                      725                 730                 735

      Leu Asp Asp Thr Gln Asp Ala Leu Lys Glu Ile Leu His Leu Glu Arg
 15                   740                 745                 750

      Gln Thr Gly Gly Gln Leu Leu Glu Glu Pro Lys Ala Leu His Phe Lys
                  755                 760                 765

 20   Gly Ser Thr His Asn Leu Arg Leu Ser Ile His Asp Ile Ala His Ser
          770                 775                 780

      Leu Trp Lys Ser Lys Leu Leu Ala Lys Tyr Gln Glu Ile Pro Phe Tyr
      785                 790                 795                 800
 25
      His Val Trp Ser Gly Ser Gln Arg Asn Leu His Cys Thr Phe Thr Leu
                      805                 810                 815

      Glu Arg Phe Ser Leu Asn Thr Val Glu Leu Val Cys Lys Leu Cys Val
 30               820                 825                 830

      Arg Gln Val Glu Gly Glu Gly Gln Ile Phe Gln Leu Asn Cys Thr Val
              835                 840                 845

 35   Ser Glu Glu Pro Thr Gly Ile Asp Leu Pro Leu Leu Asp Pro Ala Asn
          850                 855                 860

      Thr Ile Thr Thr Val Thr Gly Pro Ser Ala Phe Ser Ile Pro Leu Pro
      865                 870                 875                 880
 40
      Ile Arg Gln Lys Leu Cys Ser Ser Leu Asp Ala Pro Gln Thr Arg Gly
                  885                 890         .         895

      His Asp Trp Arg Met Leu Ala His Lys Leu Asn Leu Asp Arg Tyr Leu
 45               900                 905                 910

      Asn Tyr Phe Ala Thr Lys Ser Ser Pro Thr Gly Val Ile Leu Asp Leu
              915                 920                 925

 50   Trp Glu Ala Gln Asn Phe Pro Asp Gly Asn Leu Ser Met Leu Ala Ala
          930                 935                 940

      Val Leu Glu Glu Met Gly Arg His Glu Thr Val Val Ser Leu Ala Ala
      945                 950                 955                 960
 55
      Glu Gly Gln Tyr
```

    60  <210> 3
        <211> 2780
        <212> DNA
        <213> Homo sapiens

    65  <400> 3
        ctgaaaacag aagatagaga ggagtctcgg agctcgccat ctccagcgat ctctacattg 60
        ggaaaaaaca tggagtcagc tccggcagcc cccgaccccg ccgccagcga gccaggcagc 120
        agcggcgcgg acgcggccgc cggctccagg gagaccccgc tgaaccagga atccgcccgc 180

- 5 -

```
aagagcgagc cgcctgcccc ggtgcgcaga cagagctatt ccagcaccag cagagatgat 240
gacttttttc atgaactccc agaaactttt ccttctgatc cacctgagcc tctgccacat 300
ttccttattg agcctgaaga agcttatatt gtgaagaata agcctgtgaa cctgtactgt 360
aaagcaagcc ctgccaccca gatctatttc aagtgtaata gtgaatgggt tcatcagaag 420
gaccacatag tagatgaaag agtagatgaa acttccggtc tcattgtccg ggaagtgagc 480
attgagattt cgcgccagca agtggaagaa ctctttggac ctgaagatta ctggtgccag 540
tgtgtggcct ggagctccgc gggtaccaca aagagccgga aggcgtatgt gcgcattgca 600
tatctacgga agacatttga gcaggaaccc ctaggaaagg aagtgtcttt ggaacaggaa 660
gtcttactcc agtgtcgacc acctgaaggg atcccagtgg ctgaggtgga atggttgaaa 720
aatgaagaca taattgatcc cgttgaagat cggaattttt atattactat tgatcacaac 780
ctcatcataa agcaggcccg actctctgat actgcaaatt acacctgtgt tgccaaaaac 840
attgttgcca agaggaaaag tacaactgcc actgtcatag tctatgtcaa cggtggctgg 900
tccacctgga cggagtggtc tgtgtgtaac agccgctgtg acgagggta tcagaaacgt 960
acaaggactt gtaccaaccc ggcaccactc aatggggggtg ccttctgtga agggcagagt 1020
gtgcagaaaa tagcctgtac tacgttatgc ccagtggatg gcaggtggac gccatggagc 1080
aagtggtcta cttgtggaac tgagtgcacc cactggcgca ggagggagtg cacggcgcca 1140
gcccccaaga atggaggcaa ggactgcgac ggcctcgtct tgcaatccaa gaactgcact 1200
gatgggcttt gcatgcagag tttcatttat cccatttcaa ctgaacagag aacccagaat 1260
gaatatggat tttcttctgc tcctgattca gatgatgttg ctctctatgt tgggattgtg 1320
atagcagtga tcgtttgcct ggcgatctct gtagttgtgg ccttgtttgt gtatcggaag 1380
aatcatcgtg actttgagtc agatattatt gactcttcgg cactcaatgg gggctttcag 1440
cctgtgaaca tcaaggcagc aagacaagat ctgctggctg tacccccaga cctcacgtca 1500
gctgcagcca tgtacagagg acctgtctat gccctgcatg acgtctcaga caaaatccca 1560
atgaccaact ctccaattct ggatccactg cccaacctga aaatcaaagt gtacaacacc 1620
tcaggtgctg tcacccccca agatgacctc tctgagttta cgtccaagct gtcccctcag 1680
atgacccagt cgttgttgga gaatgaagcc ctcagcctga gaaccagag tctagcaagg 1740
cagactgatc catcctgtac cgcatttggc agcttcaact cactgggagg tcaccttatt 1800
gttcccaatt caggagtcag cttgctgatt cccgctgggg ccattcccca agggagagtc 1860
tacgaaatgt atgtgactgt acacaggaaa gaaactatga ggccacccat ggatgactgt 1920
cagacacttt tgaccctgt ggtgagctgt gggcccccag gagctctgct cacccgcccc 1980
gtcgtcctca ctatgcatca ctgcgcagac cccaataccg aggactggaa aatactgctc 2040
ctcgctggag tacagcatcc gagtctactg tctggatgac acccaggatg ccctgaagga 2100
aattttacat cttgagagac agacgggagg acagctccta gaagaaccta aggctcttca 2160
ttttaaaggc agcacccaca acctgcgcct gtcaattcac gatatcgccc attccctctg 2220
gaagagcaaa ttgctggcta aatatcagga aattccattt taccatgttt ggagtggatc 2280
tcaaagaaac ctgcactgca ccttcactct ggaaagattt agcctgaaca cagtggagct 2340
ggtttgcaaa ctctgtgtgc ggcaggtgga aggagaaggg cagatcttcc agctcaactg 2400
caccgtgtca gaggaaccta ctggcatcga tttgccgctg ctggatcctg cgaacaccat 2460
caccacggtc acggggccca gtgctttcag catccctctc cctatccggc agaagctctg 2520
tagcagcctg gatgcccccc agacgagagg ccatgactgg aggatgctgg cccataagct 2580
gaacctggac aggtacttga attactttgc caccaaatcc agcccaactg gcgtaatcct 2640
ggatctttgg gaagcacaga acttcccaga tggaaacctg agcatgctgg cagctgtctt 2700
ggaagaaatg ggaagacatg aaacggtggt gtccttagca gcagaagggc agtattaacc 2760
accatgctgg aaggggaaat                                             2780
```

<210> 4
<211> 669
<212> PRT
<213> Homo sapiens

<400> 4

```
Met Glu Ser Ala Pro Ala Ala Pro Asp Pro Ala Ala Ser Glu Pro Gly
1               5                   10                  15

Ser Ser Gly Ala Asp Ala Ala Ala Gly Ser Arg Glu Thr Pro Leu Asn
                20                  25                  30

Gln Glu Ser Ala Arg Lys Ser Glu Pro Pro Ala Pro Val Arg Arg Gln
            35                  40                  45

Ser Tyr Ser Ser Thr Ser Arg Asp Asp Phe Phe His Glu Leu Pro
        50                  55                  60

Glu Thr Phe Pro Ser Asp Pro Pro Glu Pro Leu Pro His Phe Leu Ile
65                  70                  75                  80

Glu Pro Glu Glu Ala Tyr Ile Val Lys Asn Lys Pro Val Asn Leu Tyr
```

|  | 85 |  |  |  |  |  |  | 90 |  |  |  |  |  | 95 |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Cys Lys Ala Ser Pro Ala Thr Gln Ile Tyr Phe Lys Cys Asn Ser Glu
        100                 105                 110

5    Trp Val His Gln Lys Asp His Ile Val Asp Glu Arg Val Asp Glu Thr
            115                 120                 125

10   Ser Gly Leu Ile Val Arg Glu Val Ser Ile Glu Ile Ser Arg Gln Gln
         130                 135                 140

     Val Glu Glu Leu Phe Gly Pro Glu Asp Tyr Trp Cys Gln Cys Val Ala
     145                 150                 155                 160

15   Trp Ser Ser Ala Gly Thr Thr Lys Ser Arg Lys Ala Tyr Val Arg Ile
                     165                 170                 175

     Ala Tyr Leu Arg Lys Thr Phe Glu Gln Glu Pro Leu Gly Lys Glu Val
                 180                 185                 190

20   Ser Leu Glu Gln Glu Val Leu Leu Gln Cys Arg Pro Pro Glu Gly Ile
                 195                 200                 205

25   Pro Val Ala Glu Val Glu Trp Leu Lys Asn Glu Asp Ile Ile Asp Pro
         210                 215                 220

     Val Glu Asp Arg Asn Phe Tyr Ile Thr Ile Asp His Asn Leu Ile Ile
     225                 230                 235                 240

30   Lys Gln Ala Arg Leu Ser Asp Thr Ala Asn Tyr Thr Cys Val Ala Lys
                     245                 250                 255

     Asn Ile Val Ala Lys Arg Lys Ser Thr Thr Ala Thr Val Ile Val Tyr
                 260                 265                 270

35   Val Asn Gly Gly Trp Ser Thr Trp Thr Glu Trp Ser Val Cys Asn Ser
                 275                 280                 285

40   Arg Cys Gly Arg Gly Tyr Gln Lys Arg Thr Arg Thr Cys Thr Asn Pro
         290                 295                 300

     Ala Pro Leu Asn Gly Gly Ala Phe Cys Glu Gly Gln Ser Val Gln Lys
     305                 310                 315                 320

45   Ile Ala Cys Thr Thr Leu Cys Pro Val Asp Gly Arg Trp Thr Pro Trp
                     325                 330                 335

     Ser Lys Trp Ser Thr Cys Gly Thr Glu Cys Thr His Trp Arg Arg Arg
                 340                 345                 350

50   Glu Cys Thr Ala Pro Ala Pro Lys Asn Gly Gly Lys Asp Cys Asp Gly
         355                 360                 365

     Leu Val Leu Gln Ser Lys Asn Cys Thr Asp Gly Leu Cys Met Gln Ser
55       370                 375                 380

     Phe Ile Tyr Pro Ile Ser Thr Glu Gln Arg Thr Gln Asn Glu Tyr Gly
     385                 390                 395                 400

60   Phe Ser Ser Ala Pro Asp Ser Asp Asp Val Ala Leu Tyr Val Gly Ile
                 405                 410                 415

     Val Ile Ala Val Ile Val Cys Leu Ala Ile Ser Val Val Val Ala Leu
                 420                 425                 430

65   Phe Val Tyr Arg Lys Asn His Arg Asp Phe Glu Ser Asp Ile Ile Asp
         435                 440                 445

- 7 -

```
    Ser   Ser   Ala   Leu   Asn   Gly   Gly   Phe   Gln   Pro   Val   Asn   Ile   Lys   Ala   Ala
          450                           455                     460

    Arg   Gln   Asp   Leu   Leu   Ala   Val   Pro   Pro   Asp   Leu   Thr   Ser   Ala   Ala   Ala
 5  465                           470                     475                           480

    Met   Tyr   Arg   Gly   Pro   Val   Tyr   Ala   Leu   His   Asp   Val   Ser   Asp   Lys   Ile
                      485                           490                           495

10  Pro   Met   Thr   Asn   Ser   Pro   Ile   Leu   Asp   Pro   Leu   Pro   Asn   Leu   Lys   Ile
                      500                           505                     510

    Lys   Val   Tyr   Asn   Thr   Ser   Gly   Ala   Val   Thr   Pro   Gln   Asp   Asp   Leu   Ser
                515                     520                     525

15  Glu   Phe   Thr   Ser   Lys   Leu   Ser   Pro   Gln   Met   Thr   Gln   Ser   Leu   Leu   Glu
          530                           535                     540

    Asn   Glu   Ala   Leu   Ser   Leu   Lys   Asn   Gln   Ser   Leu   Ala   Arg   Gln   Thr   Asp
20  545                           550                     555                           560

    Pro   Ser   Cys   Thr   Ala   Phe   Gly   Ser   Phe   Asn   Ser   Leu   Gly   Gly   His   Leu
                      565                           570                           575

25  Ile   Val   Pro   Asn   Ser   Gly   Val   Ser   Leu   Leu   Ile   Pro   Ala   Gly   Ala   Ile
                      580                           585                           590

    Pro   Gln   Gly   Arg   Val   Tyr   Glu   Met   Tyr   Val   Thr   Val   His   Arg   Lys   Glu
                595                           600                     605

30
    Thr   Met   Arg   Pro   Pro   Met   Asp   Asp   Ser   Gln   Thr   Leu   Leu   Thr   Pro   Val
          610                           615                     620

    Val   Ser   Cys   Gly   Pro   Pro   Gly   Ala   Leu   Leu   Thr   Arg   Pro   Val   Val   Leu
35  625                           630                     635                           640

    Thr   Met   His   His   Cys   Ala   Asp   Pro   Asn   Thr   Glu   Asp   Trp   Lys   Ile   Leu
                      645                           650                           655

40  Leu   Leu   Ala   Gly   Val   Gln   His   Pro   Ser   Leu   Leu   Ser   Gly
                      660                           665
```

```
       <210> 5
45     <211> 1863
       <212> DNA
       <213> Homo sapiens

       <400> 5
50     gtttttttt  ttttttggt  accatagagt  tgctctgaaa  acagaagata  gagggagtct   60
       cggagctcgc  atctccagcg  atctctacat  tgggaaaaaa  catggagtca  gctccggcag  120
       cccccgaccc  cgccgccagc  gagccaggca  gcagcggcgc  ggacgcggcc  gccggctcca  180
       gggagacccc  gctgaaccag  gaatccgccc  gcaagagcga  gccgcctgcc  ccggtgcgca  240
       gacagagcta  ttccagcacc  agcagaggta  tctcagtaac  gaagaagaca  catacatctc  300
55     aaattgaaat  tattccatgc  aagatctgtg  gagacaaatc  atcaggaatc  cattatggtg  360
       tcattacatg  tgaaggctgc  aagggctttt  tcaggagaag  tcagcaaagc  aatgccacct  420
       actcctgtcc  tcgtcagaag  aactgtttga  ttgatcgaac  cagtagaaac  cgctgccaac  480
       actgtcgatt  acagaaatgc  cttgccgtag  ggatgtctcg  agatgctgta  aaatttggcc  540
       gaatgtcaaa  aaagcagaga  gacagcttgt  atgcagaagt  acagaaacac  cggatgcagc  600
60     agcagcagcg  cgaccaccag  cagcagcctg  gagaggctga  gccgctgacg  cccacctaca  660
       acatctcggc  caacgggctg  acggaacttc  acgacgacct  cagtaactac  attgacgggc  720
       acaccctga  ggggagtaag  gcagactccg  ccgtcagcag  cttctacctg  gacatacagc  780
       cttccccaga  ccagtcaggt  cttgatatca  atggaatcaa  accagaacca  atatgtgact  840
       acacaccagc  atcaggcttc  tttcccctact  gttcgttcac  caacggcgag  acttccccaa  900
65     ctgtgtccat  ggcagaatta  aacaccttg   cacagaatat  atctaaatcg  catctggaaa  960
       cctgccaata  cttgaggagaa  gagctccagc  agataacgtg  cagacctttt  ttacaggaag  1020
       aaattgagaa  ctatcaaaac  aagcagcggg  aggtgatgtg  caattgtgt  gccatcaaaa  1080
       ttacagaagc  tatacagtat  gtggtggagt  ttgccaaacg  cattgatgga  tttatggaac  1140
```

```
       tgtgtcaaaa tgatcaaatt gtgcttctaa aagcaggttc tctagaggtg gtgtttatca 1200
       gaatgtgccg tgcctttgac tctcagaaca acaccgtgta ctttgatggg aagtatgcca 1260
       gccccgacgt cttcaaatcc ttaggttgtg aagactttat tagctttgtg tttgaatttg 1320
       gaaagagttt atgttctatg cacctgactg aagatgaaat tgcattattt tctgcatttg 1380
5      tactgatgtc agcagatcgc tcatggctgc aagaaaaggt aaaaattgaa aaactgcaac 1440
       agaaaattca gctagctctt caacacgtcc tacagaagaa tcaccgagaa gatggaatac 1500
       taacaaagtt aatatgcaag gtgtctacat taagagcctt atgtggacga catacagaaa 1560
       agctaatggc atttaaagca atatacccag acattgtgcg acttcatttt cctccattat 1620
       acaaggagtt gttcacttca gaatttgagc cagcaatgca aattgatggg taaatgttat 1680
10     cacctaagca cttctagaat gtctgaagta caaacatgaa aaacaaacaa aaaaattaac 1740
       cgagacactt tatatggccc tgcacagacc tggagcgcca cacactgcac atcttttggt 1800
       gatcggggtc aggcaaagga ggggaaacaa tgaaaacaaa taaagttgaa cttgtttttc 1860
       tca                                                              1863
```

15

    <210> 6
    <211> 523
    <212> PRT
    <213> Homo sapiens

20

    <400> 6
    Met Glu Ser Ala Pro Ala Ala Pro Asp Pro Ala Ala Ser Glu Pro Gly
    1               5                   10                  15

25  Ser Ser Gly Ala Asp Ala Ala Ala Gly Ser Arg Glu Thr Pro Leu Asn
                    20                  25                  30

    Gln Glu Ser Ala Arg Lys Ser Glu Pro Pro Ala Pro Val Arg Arg Gln
                35                  40                  45
30
    Ser Tyr Ser Ser Thr Ser Arg Gly Ile Ser Val Thr Lys Lys Thr His
            50                  55                  60

    Thr Ser Gln Ile Glu Ile Ile Pro Cys Lys Ile Cys Gly Asp Lys Ser
35  65                  70                  75                  80

    Ser Gly Ile His Tyr Gly Val Ile Thr Cys Glu Gly Cys Lys Gly Phe
                    85                  90                  95

    Phe Arg Arg Ser Gln Gln Ser Asn Ala Thr Tyr Ser Cys Pro Arg Gln
40              100                 105                 110

    Lys Asn Cys Leu Ile Asp Arg Thr Ser Arg Asn Arg Cys Gln His Cys
                115                 120                 125
45
    Arg Leu Gln Lys Cys Leu Ala Val Gly Met Ser Arg Asp Ala Val Lys
                130                 135                 140

    Phe Gly Arg Met Ser Lys Lys Gln Arg Asp Ser Leu Tyr Ala Glu Val
50  145                 150                 155                 160

    Gln Lys His Arg Met Gln Gln Gln Gln Arg Asp His Gln Gln Gln Pro
                    165                 170                 175

55  Gly Glu Ala Glu Pro Leu Thr Pro Thr Tyr Asn Ile Ser Ala Asn Gly
                180                 185                 190

    Leu Thr Glu Leu His Asp Asp Leu Ser Asn Tyr Ile Asp Gly His Thr
                195                 200                 205
60
    Pro Glu Gly Ser Lys Ala Asp Ser Ala Val Ser Ser Phe Tyr Leu Asp
                210                 215                 220

    Ile Gln Pro Ser Pro Asp Gln Ser Gly Leu Asp Ile Asn Gly Ile Lys
65  225                 230                 235                 240

    Pro Glu Pro Ile Cys Asp Tyr Thr Pro Ala Ser Gly Phe Phe Pro Tyr
                    245                 250                 255
```

```
   Cys Ser Phe Thr Asn Gly Glu Thr Ser Pro Thr Val Ser Met Ala Glu
                   260             265             270

 5 Leu Glu His Leu Ala Gln Asn Ile Ser Lys Ser His Leu Glu Thr Cys
               275             280             285

   Gln Tyr Leu Arg Glu Glu Leu Gln Gln Ile Thr Trp Gln Thr Phe Leu
       290             295             300
10
   Gln Glu Glu Ile Glu Asn Tyr Gln Asn Lys Gln Arg Glu Val Met Trp
   305             310             315             320

15 Gln Leu Cys Ala Ile Lys Ile Thr Glu Ala Ile Gln Tyr Val Val Glu
               325             330             335

   Phe Ala Lys Arg Ile Asp Gly Phe Met Glu Leu Cys Gln Asn Asp Gln
               340             345             350

20 Ile Val Leu Leu Lys Ala Gly Ser Leu Glu Val Val Phe Ile Arg Met
               355             360             365

   Cys Arg Ala Phe Asp Ser Gln Asn Asn Thr Val Tyr Phe Asp Gly Lys
       370             375             380
25
   Tyr Ala Ser Pro Asp Val Phe Lys Ser Leu Gly Cys Glu Asp Phe Ile
   385             390             395       ·       400

   Ser Phe Val Phe Glu Phe Gly Lys Ser Leu Cys Ser Met His Leu Thr
30             405             410             415

   Glu Asp Glu Ile Ala Leu Phe Ser Ala Phe Val Leu Met Ser Ala Asp
               420             425             430

35 Arg Ser Trp Leu Gln Glu Lys Val Lys Ile Glu Lys Leu Gln Gln Lys
               435             440             445

   Ile Gln Leu Ala Leu Gln His Val Leu Gln Lys Asn His Arg Glu Asp  ·
       450             455             460
40
   Gly Ile Leu Thr Lys Leu Ile Cys Lys Val Ser Thr Leu Arg Ala Leu
   465             470             475             480

45 Cys Gly Arg His Thr Glu Lys Leu Met Ala Phe Lys Ala Ile Tyr Pro
               485             490             495

   Asp Ile Val Arg Leu His Phe Pro Pro Leu Tyr Lys Glu Leu Phe Thr
               500             505             510

50 Ser Glu Phe Glu Pro Ala Met Gln Ile Asp Gly
       515             520
```

<210> 7
<211> 1821
<212> DNA
<213> Homo sapiens

<400> 7

```
ctagattcct ctgtgtttca tacccaggag gtcagggagg gcaccttgta gtgcctgagg 60
ccccgagagg gttcacagcc acctgagaag tgtttgcagt ctatgggtgt gtgttctttc 120
tccaagctgt gtcagctgtg ggatggcgtg gagagaaaac aagaaaaagt tgtttccctc 180
agctctctgc tgaaaaaatg ctcacgggga gtcagtcaac atttggtatc tcagtaacga 240
agaagacaca tacatctcaa attgaaatta ttccatgcaa gatctgtgga gacaaatcat 300
caggaatcca ttatggtgtc attacatgtg aaggctgcaa gggctttttc aggagaagtc 360
agcaaagcaa tgccacctac tcctgtcctc gtcagaagaa ctgtttgatt gatcgtcgag 420
gtagaaaccg ctgccaacac tgtcgattac agaaatgcct tgccgtaggg atgtctcgag 480
atgctgtaaa atttggccga atgtcaaaaa agcagagaga cagcttgtat gcagaagtac 540
```

- 10 -

```
     agaaacaccg gatgcagcag cagcagcgcg accaccagca gcagcctgga gaggctgagc  600
     cgctgacgcc cacctacaac atctcggcca acgggctgac ggaacttcac gacgacctca  660
     gtaactacat tgacgggcac acccctgagg ggagtaaggc agactccgcc gtcagcagct  720
     tctacctgga catacagcct tccccagacc agtcaggtct tgatatcaat ggaatcaaac  780
 5   cagaaccaat atgtgactac acaccagcat caggcttctt tccctactgt tcgttcacca  840
     acggcgagac ttccccaact gtgtccatgg cagaattaga acaccttgca cagaatatat  900
     ctaaatcgca tctggaaacc tgccaatact tgagagaaga gctccagcag ataacgtggc  960
     agaccttttt acaggaagaa attgagaact atcaaaacaa gcagcgggag gtgatgtggc 1020
     aattgtgtgc catcaaaatt acagaagcta tacagtatgt ggtggagttt gccaaacgca 1080
10   ttgatggatt tatggaactg tgtcaaaatg atcaaattgt gcttctaaaa gcaggttctc 1140
     tagaggtggt gtttatcaga atgtgccgtg cctttgactc tcagaacaac accgtgtact 1200
     ttgatgggaa gtatgccagc cccgacgtct tcaaatcctt aggttgtgaa gacttttatta 1260
     gctttgtgtt tgaatttgga aagagtttat gttctatgca cctgactgaa gatgaaattg 1320
     cattattttc tgcatttgta ctgatgtcag cagatcgctc atggctgcaa gaaaaggtaa 1380
15   aaattgaaaa actgcaacag aaaattcagc tagctcttca acacgtccta cagaagaatc 1440
     accgagaaga tggaatacta acaaagttaa tatgcaaggt gtctacatta agagccttat 1500
     gtggacgaca tacagaaaag ctaatggcat ttaaagcaat atacccagac attgtgcgac 1560
     ttcattttcc tccattatac aaggagttgt tcacttcaga atttgagcca gcaatgcaaa 1620
     ttgatgggta aatgttatca cctaagcact tctagaatgt ctgaagtaca aacatgaaaa 1680
20   acaaacaaaa aaattaaccg agacacttta tatggccctg cacagacctg gagcgccaca 1740
     cactgcacat cttttggtga tcggggtcag gcaaggagg ggaaacaatg aaaacaaata 1800
                                                                       1821
     aagttgaact tgttttttctc a
```

25 <210> 8
   <211> 477
   <212> PRT
   <213> Homo sapiens

30 <400> 8
   Met Leu Thr Gly Ser Gln Ser Thr Phe Gly Ile Ser Val Thr Lys Lys
    1               5                  10                  15

   Thr His Thr Ser Gln Ile Glu Ile Ile Pro Cys Lys Ile Cys Gly Asp
35                 20                  25                  30

   Lys Ser Ser Gly Ile His Tyr Gly Val Ile Thr Cys Glu Gly Cys Lys
               35                  40                  45

40 Gly Phe Phe Arg Arg Ser Gln Gln Ser Asn Ala Thr Tyr Ser Cys Pro
           50                  55                  60

   Arg Gln Lys Asn Cys Leu Ile Asp Arg Thr Ser Arg Asn Arg Cys Gln
    65                  70                  75                  80
45
   His Cys Arg Leu Gln Lys Cys Leu Ala Val Gly Met Ser Arg Asp Ala
                   85                  90                  95

   Val Lys Phe Gly Arg Met Ser Lys Lys Gln Arg Asp Ser Leu Tyr Ala
50             100                 105                 110

   Glu Val Gln Lys His Arg Met Gln Gln Gln Arg Asp His Gln Gln
               115                 120                 125

55 Gln Pro Gly Glu Ala Glu Pro Leu Thr Pro Thr Tyr Asn Ile Ser Ala
           130                 135                 140

   Asn Gly Leu Thr Glu Leu His Asp Asp Leu Ser Asn Tyr Ile Asp Gly
60 145                 150                 155                 160

   His Thr Pro Glu Gly Ser Lys Ala Asp Ser Ala Val Ser Ser Phe Tyr
                   165                 170                 175

   Leu Asp Ile Gln Pro Ser Pro Asp Gln Ser Gly Leu Asp Ile Asn Gly
65                 180                 185                 190

   Ile Lys Pro Glu Pro Ile Cys Asp Tyr Thr Pro Ala Ser Gly Phe Phe
               195                 200                 205

```
     Pro Tyr Cys Ser Phe Thr Asn Gly Glu Thr Ser Pro Thr Val Ser Met
         210                 215                 220
  5  Ala Glu Leu Glu His Leu Ala Gln Asn Ile Ser Lys Ser His Leu Glu
     225                 230                 235                 240
     Thr Cys Gln Tyr Leu Arg Glu Glu Leu Gln Gln Ile Thr Trp Gln Thr
                     245                 250                 255
 10  Phe Leu Gln Glu Glu Ile Glu Asn Tyr Gln Asn Lys Gln Arg Glu Val
                 260                 265                 270
     Met Trp Gln Leu Cys Ala Ile Lys Ile Thr Glu Ala Ile Gln Tyr Val
 15      275                 280                 285
     Val Glu Phe Ala Lys Arg Ile Asp Gly Phe Met Glu Leu Cys Gln Asn
         290                 295                 300
 20  Asp Gln Ile Val Leu Leu Lys Ala Gly Ser Leu Glu Val Val Phe Ile
     305                 310                 315                 320
     Arg Met Cys Arg Ala Phe Asp Ser Gln Asn Asn Thr Val Tyr Phe Asp
                     325                 330                 335
 25  Gly Lys Tyr Ala Ser Pro Asp Val Phe Lys Ser Leu Gly Cys Glu Asp
                 340                 345                 350
     Phe Ile Ser Phe Val Phe Glu Phe Gly Lys Ser Leu Cys Ser Met His
 30      355                 360                 365
     Leu Thr Glu Asp Glu Ile Ala Leu Phe Ser Ala Phe Val Leu Met Ser
         370                 375                 380
 35  Ala Asp Arg Ser Trp Leu Gln Glu Lys Val Lys Ile Glu Lys Leu Gln
     385                 390                 395                 400
     Gln Lys Ile Gln Leu Ala Leu Gln His Val Leu Gln Lys Asn His Arg
                 405                 410                 415
 40  Glu Asp Gly Ile Leu Thr Lys Leu Ile Cys Lys Val Ser Thr Leu Arg
                 420                 425                 430
     Ala Leu Cys Gly Arg His Thr Glu Lys Leu Met Ala Phe Lys Ala Ile
 45      435                 440                 445
     Tyr Pro Asp Ile Val Arg Leu His Phe Pro Pro Leu Tyr Lys Glu Leu
         450                 455                 460
 50  Phe Thr Ser Glu Phe Glu Pro Ala Met Gln Ile Asp Gly
     465                 470                 475
```

```
     <210> 9
 55  <211> 3646
     <212> DNA
     <213> Homo sapiens
```

```
     <400> 9
 60  ctgcctttgg agaaagtgga gtgtggcgct tggttgtcgt tatttcttcg gactgcttcg   60
     cggtgcacgg attcagcttc tgcccagtgg ggctttcagc tgtttgcgcg tctctctgtc  120
     ccctcccct ccccccggca cacctctgtc tacgatgagg aaaggtctgc gggcgacagc  180
     ggccgctgc ggactgggac tgggatactt gctgcaaatg ctcgtgctac ctgccctggc  240
     cctgctcagc gccagcggca ctggctccgc cgcccaagat gatgactttt ttcatgaact  300
 65  cccagaaact tttccttctg atccacctga gcctctgcca catttcctta ttgagcctga  360
     agaagcttat attgtgaaga ataagcctgt gaacctgtac tgtaaagcaa gccctgccac  420
     ccagatctat ttcaagtgta atagtgaatg ggttcatcag aaggaccaca tagtagatga  480
     aagagtagat gaaacttccg gtctcattgt ccgggaagtg agcattgaga tttcgcgcca  540
```

- 12 -

```
      gcaagtggaa gaactctttg gacctgaaga ttactggtgc cagtgtgtgg cctggagctc 600
      cgcgggtacc acaaagagcc ggaaggcgta tgtgcgcatt gcatatctac ggaagacatt 660
      tgagcaggaa cccctaggaa aggaagtgtc tttggaacag gaagtcttac tccagtgtcg 720
      accacctgaa gggatcccag tggctgaggt ggaatggttg aaaaatgaag acataattga 780
  5   tcccgttgaa gatcggaatt tttatattac tattgatcac aacctcatca taaagcaggg 840
      ccgactctct gatactgcaa attacacctg tgttgccaaa aacattgttg ccaagaggaa 900
      aagtacaact gccactgtca tagtctatgt caacggtggc tggtccacct ggacggagtg 960
      gtctgtgtgt aacagccgct gtggacgagg gtatcagaaa cgtacaagga cttgtaccaa 1020
      cccggcacca ctcaatgggg gtgccttctg tgaagggcag agtgtgcaga aaatagcctg 1080
  10  tactacgtta tgcccagtgg atggcaggtg gacgccatgg agcaagtggt ctacttgtgg 1140
      aactgagtgc acccactggc gcaggaggga gtgcacggcg ccagccccca gaatggagg 1200
      caaggactgc gacggcctcg tcttgcaatc caagaactgc actgatgggc tttgcatgca 1260
      gactgctcct gattcagatg atgttgctct ctatgttggg attgtgatag cagtgatcgt 1320
      ttgcctggcg atctctgtag ttgtggcctt gtttgtgtat cggaagaatc atcgtgactt 1380
  15  tgagtcagat attattgact cttcggcact caatgggggc tttcarcctg tgaacatcaa 1440
      ggcagcaaga caagatctgc tggctgtacc cccagacctc acgtcagctg cagccatgta 1500
      cagaggacct gtctatgccc tgcatgacgt ctcagacaaa atcccaatga ccaactctcc 1560
      aattctggat ccactgccca acctgaaaat caaagtgtac aacacctcag gtgctgtctc 1620
      cccccaagat gacctctctg agtttacgtc caagctgtcc cctcagatga cccagtcgtt 1680
  20  gttggagaat gaagccctca gcctgaagaa ccagagtcta gcaaggcaga ctgatccatc 1740
      ctgtaccgca tttggcagct tcaactcgct gggaggtcac cttattgttc ccaattcagg 1800
      agtcagcttg ctgattcccg ctggggccat tccccaaggg agagtctacg aaatgtatgt 1860
      gactgtacac aggaaagaaa ctatgaggcc acccatggat gactctcaga cacttttgac 1920
      ccctgtggtg agctgtgggc ccccaggagc tctgctcacc cgccccgtcg tcctcactat 1980
  25  gcatcactgc gcagacccca ataccgagga ctggaaaata ctgctcaaga accaggcagc 2040
      acagggacag tgggaggatg tggtggtggt cggggaggaa aacttcacca ccccctgcta 2100
      cattaagctg gatgcagagg cctgccacat cctcacagag aacctcagca cctacgccct 2160
      ggtaggacat tccaccacca agcggctgc aaagcgcctc aagctggcca tctttgggcc 2220
      cctgtgctgc tcctcgctgg agtacagcat ccgagtctac tgtctggatg acaccccagga 2280
  30  tgccctgaag gaaattttac atcttgagag acagacggga ggacagctcc tagaagaacc 2340
      taaggctctt cattttaaag gcagcaccca caacctcgcg ctgtcaattc acgatatcgc 2400
      ccattccctc tggaagagca aattgctggc taaatatcag gaaattccat tttaccatgt 2460
      ttggagtgga tctcaaagaa acctgcactg caccttcact ctggaaagat ttagcctgaa 2520
      cacagtggag ctggtttgca aactctgtgt gcggcaggtg gaaggagaag ggcagatctt 2580
  35  ccagctcaac tgcaccgtgt cagaggaacc tactggcatc gatttgccgc tgctggatcc 2640
      tgcgaacacc atcaccacgg tcacggggcc cagtgctttc agcatccctc tccctatccg 2700
      gcagaagctc tgtagcagcc tggatgcccc ccagacgaga ggccatgact ggaggatgct 2760
      ggcccataag ctgaacctgg acaggtactt gaattacttt gccaccaaat ccagcccaac 2820
      tggcgtaatc ctggatcttt gggaagcaca gaacttccca gatggaaacc tgagcatgct 2880
  40  ggcagctgtc ttggaagaaa tgggaagaca tgaaacggtg gtgtccttag cagcagaagg 2940
      gcagtattaa ccaccatgct ggaaggggaa atgaaggaca aaaatgcaca gggagtctgt 3000
      ggccgtccag gtgaatcaca gctgaggagg aaatccagat gagaccaatg cacttcacag 3060
      gcaagaatgc agcaggagcc agaaggaaaa cagatacaac tgcccatgta catgcccact 3120
      ttactcggag atcatcacgg gagttaagaa aaattgtgta aatttgtacc ttgaatttag 3180
  45  ctatcaacct aatttttcctc ttagttgggc tgtatgctgt gtggtacagg atcttacagt 3240
      ttcctaggaa acgctttta ttgctatcca gatatatgga taaactttct taacaaaccc 3300
      aatttctaca aatgttgttt acatcaaatt ggacagggat gcagacactg tccatggctc 3360
      gttctatttt tgttcaaatc atttgaagtt gaagctgtgg acggtttgtt gtgtctattt 3420
      cagattagta atttacagag aaatcacaga cttttgctac aaatcgtgtg catcaagtgt 3480
  50  ctcagataat cctcccatca gtgttctgtt tctagaactt gtagaaccag tgttactgtt 3540
      tgtatcaggg aagtggagaa tctaagtgta aaaaagaaat aactaagact cctattcctt 3600
      ggagggaccc ttctggtgcc ctttgggaat aaagctgtag cactgc            3646
```

```
  55  <210> 10
      <211> 931
      <212> PRT
      <213> Homo sapiens

  60  <400> 10
      Met Arg Lys Gly Leu Arg Ala Thr Ala Ala Arg Cys Gly Leu Gly Leu
       1               5                  10                  15

      Gly Tyr Leu Leu Gln Met Leu Val Leu Pro Ala Leu Ala Leu Leu Ser
  65          20                  25                  30

      Ala Ser Gly Thr Gly Ser Ala Ala Gln Asp Asp Asp Phe Phe His Glu
              35                  40                  45
```

```
      Leu Pro Glu Thr Phe Pro Ser Asp Pro Pro Glu Pro Leu Pro His Phe
          50              55              60

  5   Leu Ile Glu Pro Glu Glu Ala Tyr Ile Val Lys Asn Lys Pro Val Asn
          65              70              75              80

      Leu Tyr Cys Lys Ala Ser Pro Ala Thr Gln Ile Tyr Phe Lys Cys Asn
 10                   85              90              95

      Ser Glu Trp Val His Gln Lys Asp His Ile Val Asp Glu Arg Val Asp
                  100             105             110

      Glu Thr Ser Gly Leu Ile Val Arg Glu Val Ser Ile Glu Ile Ser Arg
 15       115             120             125

      Gln Gln Val Glu Glu Leu Phe Gly Pro Glu Asp Tyr Trp Cys Gln Cys .
          130             135             140

 20   Val Ala Trp Ser Ser Ala Gly Thr Thr Lys Ser Arg Lys Ala Tyr Val
      145             150             155             160

      Arg Ile Ala Tyr Leu Arg Lys Thr Phe Glu Gln Glu Pro Leu Gly Lys
                      165             170             175
 25
      Glu Val Ser Leu Glu Gln Glu Val Leu Leu Gln Cys Arg Pro Pro Glu
                  180             185             190

      Gly Ile Pro Val Ala Glu Val Glu Trp Leu Lys Asn Glu Asp Ile Ile
 30       195             200             205

      Asp Pro Val Glu Asp Arg Asn Phe Tyr Ile Thr Ile Asp His Asn Leu
          210             215             220

 35   Ile Ile Lys Gln Ala Arg Leu Ser Asp Thr Ala Asn Tyr Thr Cys Val
      225             230             235             240

      Ala Lys Asn Ile Val Ala Lys Arg Lys Ser Thr Thr Ala Thr Val Ile
                      245             250             255
 40
      Val Tyr Val Asn Gly Gly Trp Ser Thr Trp Thr Glu Trp Ser Val Cys
                  260             265             270

      Asn Ser Arg Cys Gly Arg Gly Tyr Gln Lys Arg Thr Arg Thr Cys Thr
 45       275             280             285

      Asn Pro Ala Pro Leu Asn Gly Gly Ala Phe Cys Glu Gly Gln Ser Val
          290             295             300

 50   Gln Lys Ile Ala Cys Thr Thr Leu Cys Pro Val Asp Gly Arg Trp Thr
      305             310             315           . 320

      Pro Trp Ser Lys Trp Ser Thr Cys Gly Thr Glu Cys Thr His Trp Arg
                      325             330             335
 55
      Arg Arg Glu Cys Thr Ala Pro Ala Pro Lys Asn Gly Gly Lys Asp Cys
                  340             345             350

      Asp Gly Leu Val Leu Gln Ser Lys Asn Cys Thr Asp Gly Leu Cys Met
 60       355             360             365

      Gln Thr Ala Pro Asp Ser Asp Asp Val Ala Leu Tyr Val Gly Ile Val
          370             375             380

 65   Ile Ala Val Ile Val Cys Leu Ala Ile Ser Val Val Val Ala Leu Phe
      385             390             395             400

      Val Tyr Arg Lys Asn His Arg Asp Phe Glu Ser Asp Ile Ile Asp Ser
```

- 14 -

```
                    405                     410                     415
       Ser Ala Leu Asn Gly Gly Phe Gln Pro Val Asn Ile Lys Ala Ala Arg
                   420             425             430
 5     Gln Asp Leu Leu Ala Val Pro Pro Asp Leu Thr Ser Ala Ala Ala Met
                   435             440             445
       Tyr Arg Gly Pro Val Tyr Ala Leu His Asp Val Ser Asp Lys Ile Pro
10         450             455             460
       Met Thr Asn Ser Pro Ile Leu Asp Pro Leu Pro Asn Leu Lys Ile Lys
       465             470             475             480
15     Val Tyr Asn Thr Ser Gly Ala Val Ser Pro Gln Asp Asp Leu Ser Glu
                   485             490             495
       Phe Thr Ser Lys Leu Ser Pro Gln Met Thr Gln Ser Leu Leu Glu Asn
                   500             505             510
20     Glu Ala Leu Ser Leu Lys Asn Gln Ser Leu Ala Arg Gln Thr Asp Pro
                   515             520             525
       Ser Cys Thr Ala Phe Gly Ser Phe Asn Ser Leu Gly Gly His Leu Ile
25         530             535             540
       Val Pro Asn Ser Gly Val Ser Leu Leu Ile Pro Ala Gly Ala Ile Pro
       545             550             555             560
30     Gln Gly Arg Val Tyr Glu Met Tyr Val Thr Val His Arg Lys Glu Thr
                   565             570             575
       Met Arg Pro Pro Met Asp Asp Ser Gln Thr Leu Leu Thr Pro Val Val
                   580             585      .       590
35     Ser Cys Gly Pro Pro Gly Ala Leu Leu Thr Arg Pro Val Val Leu Thr
                   595             600             605
       Met His His Cys Ala Asp Pro Asn Thr Glu Asp Trp Lys Ile Leu Leu
40         610             615             620
       Lys Asn Gln Ala Ala Gln Gly Gln Trp Glu Asp Val Val Val Val Gly
       625             630             635             640
45     Glu Glu Asn Phe Thr Thr Pro Cys Tyr Ile Lys Leu Asp Ala Glu Ala
                   645             650             655
       Cys His Ile Leu Thr Glu Asn Leu Ser Thr Tyr Ala Leu Val Gly His
                   660             665             670
50     Ser Thr Thr Lys Ala Ala Ala Lys Arg Leu Lys Leu Ala Ile Phe Gly
                   675             680             685
       Pro Leu Cys Cys Ser Ser Leu Glu Tyr Ser Ile Arg Val Tyr Cys Leu
55         690             695             700
       Asp Asp Thr Gln Asp Ala Leu Lys Glu Ile Leu His Leu Glu Arg Gln
       705             710             715             720
60     Thr Gly Gly Gln Leu Leu Glu Glu Pro Lys Ala Leu His Phe Lys Gly
                   725             730             735
       Ser Thr His Asn Leu Arg Leu Ser Ile His Asp Ile Ala His Ser Leu
                   740             745             750      .
65     Trp Lys Ser Lys Leu Leu Ala Lys Tyr Gln Glu Ile Pro Phe Tyr His
                   755             760             765
```

- 15 -

```
        Val Trp Ser Gly Ser Gln Arg Asn Leu His Cys Thr Phe Thr Leu Glu
        770                 775             780

    Arg Phe Ser Leu Asn Thr Val Glu Leu Val Cys Lys Leu Cys Val Arg
5   785             790             795             800

    Gln Val Glu Gly Glu Gly Gln Ile Phe Gln Leu Asn Cys Thr Val Ser
                805             810             815

10  Glu Glu Pro Thr Gly Ile Asp Leu Pro Leu Leu Asp Pro Ala Asn Thr
                820             825             830

    Ile Thr Thr Val Thr Gly Pro Ser Ala Phe Ser Ile Pro Leu Pro Ile
                835             840             845

15
    Arg Gln Lys Leu Cys Ser Ser Leu Asp Ala Pro Gln Thr Arg Gly His
        850             855             860

    Asp Trp Arg Met Leu Ala His Lys Leu Asn Leu Asp Arg Tyr Leu Asn
20  865             870             875             880

    Tyr Phe Ala Thr Lys Ser Ser Pro Thr Gly Val Ile Leu Asp Leu Trp
                885             890             895

25  Glu Ala Gln Asn Phe Pro Asp Gly Asn Leu Ser Met Leu Ala Ala Val
                900             905             910

    Leu Glu Glu Met Gly Arg His Glu Thr Val Val Ser Leu Ala Ala Glu
                915             920             925

30
    Gly Gln Tyr
        930
```

```
35  <210> 11
    <211> 6277
    <212> DNA
    <213> Homo sapiens

40  <400> 11
    ataaagcaca tttagcattg ttgtgtttta ataactgcaa atgttctaaa tgtgaataag 60
    agcatataat taagattttt tgaataaact cctaaaattg aaatgtttgt gttgtcttta 120
    tatcattacc ctaatgccca tttttggttg aggtatttga cagccagaat aatggctccc 180
    caaggatgtc catggttttg gaattaaga atatgttaca ttacatggca aatctgtaga 240
45  aattaaagta gcagatggat ttaaagttgc taatctgctg actttaagag aggtagattt 300
    tcttggatta ttccattggg tccaatatta tcacaataat ttctaaatgt ggaggaaatt 360
    agaagaagtg agtgctttga tacgagaagt acttgaacca tacttgctgg gtgtgaagat 420
    ggggggaaggg gccactagcc aaagaatgta ggtgtcctct ggaagctgga aacagctaga 480
    aaacatgctt tctgtagagg ctgcagaaag gagctcagct ctgggatcat tctcagttcc 540
50  ttaaggctgc cctctggtcc tagccttggc tagcctaggc cttggccttc tcatagaatc 600
    acaatttatt ttttaaaaag tcatcaagag aattaatctc tcaagcttgc catgatcatg 660
    tcttatgtaa tctaatcaag gaaatggaat atccctcat atccataagc cctggccaca 720
    ctcaagagaa aaacatatac atggcaaata tagcagagaa caagaaattt ggaggccatc 780
    ttggaattct gtctacaaca ctcctggtat tccctctgtg tgtttgtctt tgtctctctc 840
55  cacatatata tacgtacata cacatccatg cacatatgta tttgtattac ttttttcaat 900
    gtagacatat cagcttctta taatatttga tttctttgtt tttccactag ttcagtcata 960
    tttcgctgtt ttagctacca gatcccatct gatacatgaa aacaacatga agaagataaa 1020
    gaaagtttct ctatgcatct tttctctcgt gacattcaat tgcatactca ccatcaccca 1080
    aacagcaaaa ttattgactg acacttcaaa taatctcttc taatacttat ttacattaaa 1140
60  aatatttttc tttatgaggg tgaagtagaa attaattcac agctctgtac tctggacaaa 1200
    gaaaaaactg taacaaaaaa atcttcacac tgatctaaca ctttatattc tcatgagtca 1260
    agtgattaat taaattccaa tgctcctctg aaggaggttg ggcatttcta taattaaaa 1320
    aatatcgccg ggcatggtgg ctcacgtctg taatcccagc actttgggaa gccaaggcag 1380
    gcagatcacg aggtcaggag atcgagacca tcctggctta cacggtgaaa ccctgtctct 1440
65  actaaaaata caaaaaaaaa aaaagttagg tgggcgtagt ggcgggcgcc tgtagtccca 1500
    gctactcggg aggctgaggc agaagaatgg cgtgaaccca ggaggcggag cttgcagtga 1560
    gccaagatcg tgccactgca ctccagcctg ggtgacagag cgagactcca tctcaaaaaa 1620
    aaaaaaaaaa ttataactaa agttttgaat taaatcattc tgattgtcca ggaatgcaca 1680
```

- 16 -

```
cccttaaata tatgtaataa aaaattaaag atttcttata gaaaaactta ttgaaaaagt 1740
ccctgaaaga taacaaatga tattataaac tatgtatttc tgtagtaaat ttcccaaaaa 1800
tacataattt tatgagcaaa atggtgtgga atatataaaa tattgtatgt atgtgtgtgt 1860
atataagctt tttaagtgaa gttaagaaac atgaatgagg acctatgaag cattatttct 1920
gtgcacgtac caatatcctg ttatttccag tgcccaaccc taagatctct gactctacca 1980
cattaacttc agactaaaaa ctaacccttt taaacacacc gtaaatgatt ttttttttgtt 2040
aaatgcaact taaaaatttc aaaatatata atagtaaaaa tgatgtttaa tatattgtgt 2100
tgaaatgtta aagaataaac tgtagtttga atgcatctga atattttgta ggcatgcaac 2160
agctcttagt aagaaaccat tccatctttc tgagagaaag ttgtatatta actgaagaga 2220
ggcatcttgt tttgatctgg aggcacaaga aatcttaaag tgtgaatccc attaggttat 2280
aagataaaaa aaaatcctat cagagaatag gaaaataaaa accactagta atctcattac 2340
tgcctcttca aatactactg ctatataggt gaacagcttc ccctctagtc tttcctcttt 2400
cttcccaaaa tagccgacga gtggatcaag catgtctagt gggatataag cacaaagtat 2460
gcttattctt gttttctcct ctttttattt gttctgatta ttaatttttc ccctagtcat 2520
agttcttttt ttggatgaaa tttagggcaa gtgttcaggc ttacctagtt acttcagatg 2580
atgacatctc ctctaaacag taattaatat tttcagtcca tggtaatatt caacatttta 2640
agctcattta aaatactaac tatgcccct gatatggttt gactctgtgt ctacacccaa 2700
atctcatgtc aaattgtaat ccccacttat tgaaggtggg gactggtggg aggtgattgg 2760
atcatagtcg ggggttccag tggtttagcg ccatcctccc tagggctgtc ttgtgataga 2820
gttctcacca gatccgatga gatctgatgg tttcaaagtg tgtagcagtc tcagtctctc 2880
tgtctgtctg tctgtctctc tctctgtctc tcaatccct gctccaccat ggtaagatgt 2940
gcttacttcc cctttatgtt ttgacacgat tgtaagtttc ctgaggcctc ccagccatgc 3000
ttctgtacag cctgaggaac tgtgagtcaa ttaaatgtct tttcttcata aactacccag 3060
tctcaggtag ttctttatag cagcatgaaa acagactaat acacccctt tctcagcctg 3120
tgcttgtggt aaggctagcc aatgcaagca gaaagagggg tgctgtctgc tgtttctcca 3180
attggcatct gtgccccttc ttcatcttgt cagttatagt gggaggccca agacttactt 3240
ttggcctcag acacagtcaa ggatcatcct gatgcaaaaa acaaaatcac ctttgaacct 3300
cttcctccac accatcttcc actttggttt tccgctatgc ctttgtactg gggacaaaga 3360
ctatccacga atccttactt taaaaactga ggcagtggct ctgaatcatt ccccttgga 3420
cacccccaca catctgaaca ccctcgtgtc ccaacaccac atctgctgaa gttgactgga 3480
cctgaaatgc tggaggctca gtgttttcgg aaactgcgga gagttctcct gccacaattc 3540
tcttgttgtc cgtcaaaagc aattacatgt ttcagatgat gaaaagcact gtcatgaaaa 3600
gctggcacag cagccaagga gacagatgta ttaaaccaca cggcttctca gaactcccac 3660
ttacgttgga gctcagcaca gagatgagca tggtgatatc ccccgtcta acatcctccc 3720
atttggattt aatgcatgag gctcgtttct gatgaggtgc caaattcttt cggtggacaa 3780
acacaaagtt gcagaattca gtgatcatac aagtccatgt cctcaaacga aaataataat 3840
actataaatg caaagatgct accataaaaa atacagtagg tggactttg tgagtcaaca 3900
taaaaaaatc cagcattct aactggtagc atgaggagta ccagtctgca ggatgttaac 3960
gcactgatag gctatggaca atatattcca cacttacgga agtgggggaaa ctataggtca 4020
gacaaagcta caggtacttc tttctttctt ttttcttttt ttctttctga gatggagtct 4080
ccctctgtcg cctaggctgg agtgcaatgg catgatctca gctcactgca acctccgcct 4140
cccgggttca agtgattctc ctgcctcagc ctcctgagta gctgggatta taggcgcaca 4200
ccaccaacca cccggctaat tttcatatt tttagtagaa acgaggtttc actgtgttag 4260
ccagaatggt ctcgaactcc tgacctaggt gatctgcctg cctcagcctc ccaaagtgct 4320
gggattacag gtgtgagcca cggcactcgg cccaagtact tcttaactgc aggacttctc 4380
agaggctttt aatatggtaa tgagtgctgt gcagtgagat gactcaaatc aatatatagc 4440
caacacgttt gatatgacca cagaacccat ttccctgaac acttttatc acctcctaga 4500
gcaggggtca gaaaactact gcccatgtgg tctgatctgg ccactgcttg ttttcgtaaa 4560
ttttcactgc ccacagccaa cctcatttgt gtacatgccg tccatggctg ctttcacact 4620
gcagccgcag cgatgagtca tgagacacgc accgtggct cacaaagtct aaaatattta 4680
ctctttggcc ctttacgaa aacgtgtaca aactttgtcc tctgaaatat agtttgggaa 4740
cctacttcac tcatgatatc aataattcta aaaaatttca aacaattttt aaagtcaaca 4800
ttgagaagtt ttccatggtt agaatttaat aattacagtc aataactctc ttaaagcatc 4860
gtgacaataa agtagaagga cactgtgtaa ttctatatgg tctctgtctt cagggagctc 4920
ccaagctagt ttgtgaaaaa gagaactcaa ggcacaaaca actgggggc aagagatgtt 4980
ctaaacacta agaggaggca atatggcata gtagaaagaa tgcaagcatg tgtaagagta 5040
aaacatacac agggcgcaga gtcacaagag tcaggggttg gtcttggctg tgataccttc 5100
tcctgcgata agagtaagac ctgctttatt gagcacttac tatgtgccag gcaccatccc 5160
agttgctttc catgaaggat tgctctttaa ttcttatcat aatgaatagg tactattatt 5220
atcccagttt atgggtgagg aaaccaagtc ttaggttgac taacttatta aaataaagca 5280
catacctagt aggtggtgaa caagagccaa aacaagtctg ttggtcagct aaccaccacg 5340
ttatagtggc tgctgcttag gggcagcata tatcctctgc atttccccag aggtgacaga 5400
agtagtggag agggtagtgc tctctaggct ctgacacaca gcccatgttt gctgactcaa 5460
caaccacaca acgtaatgct atggcacctc aggtggcagg gagggtatcg tgggctggac 5520
tgatcttcag aaggctgcat ctgagcaggg tgtggaagga tggcagaagg aagaggggag 5580
tgaggcactc agggtagaca gaaggtgata ctgccacatc ctccactcag aaggaatctg 5640
gaaggttttg acaaatatgt acattttgga gtgggaacag cagaaagtag gggctggcta 5700
cctactttcc actaccccta tccccactcc ccctaggggg tgaggcagag ataagcacgc 5760
```

- 17 -

```
      tttgtggggc acactgatcc acaaacttgc aagcctgagc tccactcagc agcagcctgg 5820
      gcaggatgaa tggtggtgtg caggtgtttg cggcatgcat agcttctctt tctcctagag 5880
      tcaatccagt gatccctgc gaaaagaatc ctccacttga cctgaatgct ctgtattggc 5940
      accttctgga caggaatcct atcgggtatt tcatcaaagc atcccacagc agttttaagt 6000
5     gtggctccat gagagtaaga caccaggaca gctgtgccac ctagtgatgc ttgcctgtac 6060
      tgtctgcatc ccagagagtg ggagaggctt cggaaaggac tggtatttgc tattttggc 6120
      caacacttct acatgcaaag gaatctgaag tctccgcctg ggcttcaaaa catttcttgt 6180
      ggcctcactg accattcccg tgagcctcag gggacatgag tgtcttcaag ctaagaggga 6240
      gcagtccaac tctgcagcac gaattaccaa ggaacat                          6277
10
```

```
      <210> 12
      <211> 1829
      <212> DNA
15    <213> Homo sapiens
```

```
      <400> 12
      ttttgccttg gttttcccag ctattaaaag ggagatatca tcattcattc aacaagcatt 60
      tcttgcggac ccattttcca cgacagaacc atccaaacca agacacttct tcctattgtg 120
20    gcaaaaatga gcaacgttaa aactccccag aatgcagagg tgactcacgt gtttatgtaa 180
      gtaagcattt agatatggct ttggaaaaga aaacacacac ctaaaagagg ctaccagcat 240
      ttgaataaag tgtgtaacct gggtgttcaa aactgtacaa cagtttctgt gtactttaag 300
      tcactatcct tcatacttct tccctttaaa ttctatttga aactaaataa tatcaacaat 360
      actttaagta agattatgct ggtgttactg atgaaattat atgcaggtct gcttggcctg 420
25    ttctcatgcg taagcctttg ataacttgtt cctaggttat ccagtctgc ttacctgagt 480
      acccacttta tcccagaaac gagacctgaa cactgtgtcc tggtttcatc tttccagtga 540
      gccagccttc tgaggcatta gcggctcagc aagaccatgg aggtgagaga ggcacaggca 600
      cactccagat gcagggtctc tgccctctgt caagagtcac acggcagaga ggacaagact 660
      cctgtcccgg gggaactgtt tttccttttg ccccacaccc cagatatctt cgtgacagcc 720
30    cctgccctga aagcccggtg agcgtcatgg cggagaagcc agcctgtttc cgattattct 780
      gcctgacagg gactatctgc tgctgtgtgc agttgtagaa atgtcataag ctcaggactc 840
      aggacacttt gacgtcgagt ccaacaggac ccatagagtc ccctgaaca attctcatct 900
      gtgtgggaag cctaaggggt ggttttaagt aggggctggc aggagagtga ggtctgggct 960
35    gcttctttac ggctcttcaa gtgccggcca tttcctggga ttcccaggag taagtcttga 1020
      ctcccatgaa tcccactgac ccctaagtgg catgggaaag gagaggacaa aaagaaagga 1080
      gttagacatt tgactaatac tgttcagagt tgaaatgcgc tctttgagca ggtaggcatt 1140
      taaagctaac ttttcctcat gggatacact tgtgggttct ttggagactg atctgcgtga 1200
      ccccaatggc tcaacgagaa tcttctccta caattccctt gactaggtaa tgccctcact 1260
      ctcctgctat cttcttctcc ctggttctca gtgtttcact gccacataaa ctctctctct 1320
40    cactgttggg gtcccattgc ccctctgagt ggaattcctg ggcaaaagat tcaatgcaag 1380
      ctcaccaggc tatctcacat tgggcctaca tctggtctcc tggaaatatg cccatatcct 1440
      ttgtctggac aatcctgaca cagacccagc ccaatgcaga agtgcctatt cttctctcag 1500
      cagcagatta acttgtctgg gagttactca tcctcagact tctcaagctc attccgacac 1560
      ctgtccacct aatgcagcaa ctgcacgtga cacaataaac acttaatgca agtcacaaat 1620
45    gggagtcaca tatataatat tattagtagc cacgctagaa aaatgagaca gaaacagata 1680
      aagttaattt caatttcagt aacatttcat ttaatctaat ctgtcaaaaa tactattgtc 1740
      tcaatatata atcaacaaaa ctgttaatga aatacattac agttttttg tattaagtct 1800
      ttgaaatgga gtgtgtattt tagacttaa                                    1829
```

```
50
      <210> 13
      <211> 2612
      <212> DNA
      <213> Homo sapiens
55
      <400> 13
      atgaggaaag gtctgcgggc gacagcggcc cgctgcggac tgggactggg atacttgctg 60
      caaatgctcg tgctacctgc cctggccctg ctcagcgcca gcggcactgg ctccgccgcc 120
      caagatgatg acttttttca tgaactccca gaaactttt cttctgatcc acctgagcct 180
60    ctgccacatt tccttattga gcctgaagaa gcttatattg tgaagaataa gcctgtgaac 240
      ctgtactgta aagcaagccc tgccacccag atctatttca agtgtaatag tgaatgggtt 300
      catcagaagg accacatagt agatgaaaga gtagatgaaa cttccggtct cattgtccgg 360
      gaagtgagca ttgagatttc cgccagcaa gtggaagaac tctttggacc tgaagattac 420
      tggtgccagt gtgtggcctg gagctccgcg ggtaccacaa agagccggaa ggcgtatgtg 480
65    cgcattgcat atctacggaa gacatttgag caggaacccc taggaaagga agtgtctttg 540
      gaacaggaag tcttactcca gtgtcgacca cctgaaggga tcccagtggc tgaggtggaa 600
      tggttgaaaa atgaagacat aattgatccc gttgaagatc ggaatttta tattactatt 660
      gatcacaacc tcatcataaa gcaggcccga ctctctgata ctgcaaatta cacctgtgtt 720
```

- 18 -

```
       gccaaaaaca ttgttgccaa gaggaaaagt acaactgcca ctgtcatagt ctatgtcaac 780
       ggtggctggt ccacctggac ggagtggtct gtgtgtaaca gccgctgtgg acgagggtat 840
       cagaaacgta caaggacttg taccaacccg gcaccactca atggggggtgc cttctgtgaa 900
       gggcagagtg tgcagaaaat agcctgtact acgttatgcc cagtggatgg caggtggacg 960
  5    ccatggagca agtggtctac ttgtggaact gagtgcaccc actggcgcag gagggagtgc 1020
       acggcgccag cccccaagaa tggaggcaag gactgcgacg gcctcgtctt gcaatccaag 1080
       aactgcactg atgggctttg catgcagact gctcctgatt cagatgatgt tgctctctat 1140
       gttgggattg tgatagcagt gatcgtttgc ctggcgatct ctgtagtcgt ggccttgttt 1200
       gtgtatcgga agaatcatcg tgactttgag tcagatatta ttgactcttc ggcactcaat 1260
  10   gggggctttc agcctgtgaa catcaaggca gcaagacaag atctgctggc tgtaccccca 1320
       gacctcacgt cagctgcagc catgtacaga ggacctgtct atgccctgca tgacgtctca 1380
       gacaaaatcc caatgaccaa ctctccaatt ctggatccac tgcccaacct gaaaatcaaa 1440
       gtgtacaaca cctcaggtgc tgtcaccccc caagatgacc tctctgagtt tacgtccaag 1500
       ctgtcccctc agatgaccca gtcgttgttg gagaatgaag ccctcagcct gaagaaccag 1560
  15   agtctagcaa ggcagactga tccatcctgt accgcatttg gcagcttcaa ctcactggga 1620
       ggtcacctta ttgttcccaa ttcaggagtc agcttgctga ttcccgctgg ggccattccc 1680
       caagggagag tctacgaaat gtatgtgact gtacacagga aagaaactat gaggccaccc 1740
       atggatgact ctcagacact tttgaccccct gtggtgagct gtgggccccc aggagctctg 1800
       ctcacccgcc ccgtcgtcct cactatgcat cactgcgcag accccaatac cgaggactgg 1860
  20   aaaatactgc tcctcgctgg agtacagcat ccgagtctac tgtctggatg acacccagga 1920
       tgccctgaag gaaattttac atcttgagag acagacggga ggacagctcc tagaagaacc 1980
       taaggctctt cattttaaag gcagcaccca caacctgcgc ctgtcaattc acgatatcgc 2040
       ccattccctc tggaagagca aattgctggc taaatatcag gaaattccat tttaccatgt 2100
       ttggagtgga tctcaaagaa acctgcactg caccttcact ctggaaagat ttagcctgaa 2160
  25   cacagtggag ctggtttgca aactctgtgt gcggcaggtg gaaggagaag ggcagatctt 2220
       ccagctcaac tgcaccgtgt cagaggaacc tactggcatc gatttgccgc tgctggatcc 2280
       tgcgaacacc atcaccacgg tcacggggcc cagtgctttc agcatccctc tccctatccg 2340
       gcagaagctc tgtagcagcc tggatgcccc ccagacgaga ggccatgact ggaggatgct 2400
       ggcccataag ctgaacctgg acaggtactt gaattacttt gccaccaaat ccagcccaac 2460
  30   tggcgtaatc ctggatcttt gggaagcaca gaacttccca gatggaaacc tgagcatgct 2520
       ggcagctgtc ttggaagaaa tgggaagaca tgaaacggtg gtgtccttag cagcagaagg 2580
       gcagtattaa ccaccatgct ggaagggggaa at                                2612
```

<210> 14
<211> 636
<212> PRT
<213> Homo sapiens

<400> 14
```
Met Arg Lys Gly Leu Arg Ala Thr Ala Ala Arg Cys Gly Leu Gly Leu
 1               5                  10                  15

Gly Tyr Leu Leu Gln Met Leu Val Leu Pro Ala Leu Ala Leu Leu Ser
            20                  25                  30

Ala Ser Gly Thr Gly Ser Ala Ala Gln Asp Asp Asp Phe Phe His Glu
        35                  40                  45

Leu Pro Glu Thr Phe Pro Ser Asp Pro Pro Glu Pro Leu Pro His Phe
    50                  55                  60

Leu Ile Glu Pro Glu Glu Ala Tyr Ile Val Lys Asn Lys Pro Val Asn
65                  70                  75                  80

Leu Tyr Cys Lys Ala Ser Pro Ala Thr Gln Ile Tyr Phe Lys Cys Asn
                85                  90                  95

Ser Glu Trp Val His Gln Lys Asp His Ile Val Asp Glu Arg Val Asp
            100                 105                 110

Glu Thr Ser Gly Leu Ile Val Arg Glu Val Ser Ile Glu Ile Ser Arg
        115                 120                 125

Gln Gln Val Glu Glu Leu Phe Gly Pro Glu Asp Tyr Trp Cys Gln Cys
    130                 135                 140

Val Ala Trp Ser Ser Ala Gly Thr Thr Lys Ser Arg Lys Ala Tyr Val
```

```
       145                150                155                160

      Arg Ile Ala Tyr Leu Arg Lys Thr Phe Glu Gln Glu Pro Leu Gly Lys
                     165             170             175
  5
      Glu Val Ser Leu Glu Gln Glu Val Leu Leu Gln Cys Arg Pro Pro Glu
                 180             185             190
 10   Gly Ile Pro Val Ala Glu Val Glu Trp Leu Lys Asn Glu Asp Ile Ile
                 195             200             205

      Asp Pro Val Glu Asp Arg Asn Phe Tyr Ile Thr Ile Asp His Asn Leu
          210             215             220

 15   Ile Ile Lys Gln Ala Arg Leu Ser Asp Thr Ala Asn Tyr Thr Cys Val
      225             230             235             240

      Ala Lys Asn Ile Val Ala Lys Arg Lys Ser Thr Thr Ala Thr Val Ile
                 245             250             255
 20
      Val Tyr Val Asn Gly Gly Trp Ser Thr Trp Thr Glu Trp Ser Val Cys
                 260             265             270

      Asn Ser Arg Cys Gly Arg Gly Tyr Gln Lys Arg Thr Arg Thr Cys Thr
 25       275             280             285

      Asn Pro Ala Pro Leu Asn Gly Gly Ala Phe Cys Glu Gly Gln Ser Val
          290             295             300

 30   Gln Lys Ile Ala Cys Thr Thr Leu Cys Pro Val Asp Gly Arg Trp Thr
      305             310             315             320

      Pro Trp Ser Lys Trp Ser Thr Cys Gly Thr Glu Cys Thr His Trp Arg
                 325             330             335
 35
      Arg Arg Glu Cys Thr Ala Pro Ala Pro Lys Asn Gly Gly Lys Asp Cys
                 340             345             350

      Asp Gly Leu Val Leu Gln Ser Lys Asn Cys Thr Asp Gly Leu Cys Met
 40       355             360             365

      Gln Thr Ala Pro Asp Ser Asp Asp Val Ala Leu Tyr Val Gly Ile Val
          370             375             380

 45   Ile Ala Val Ile Val Cys Leu Ala Ile Ser Val Val Val Ala Leu Phe
      385             390             395             400

      Val Tyr Arg Lys Asn His Arg Asp Phe Glu Ser Asp Ile Ile Asp Ser
                 405             410             415
 50
      Ser Ala Leu Asn Gly Gly Phe Gln Pro Val Asn Ile Lys Ala Ala Arg
                 420             425             430

      Gln Asp Leu Leu Ala Val Pro Pro Asp Leu Thr Ser Ala Ala Ala Met
 55       435             440             445

      Tyr Arg Gly Pro Val Tyr Ala Leu His Asp Val Ser Asp Lys Ile Pro
          450             455             460

 60   Met Thr Asn Ser Pro Ile Leu Asp Pro Leu Pro Asn Leu Lys Ile Lys
      465             470             475             480

      Val Tyr Asn Thr Ser Gly Ala Val Thr Pro Gln Asp Asp Leu Ser Glu
                 485             490             495
 65
      Phe Thr Ser Lys Leu Ser Pro Gln Met Thr Gln Ser Leu Leu Glu Asn
                 500             505             510
```

- 20 -

```
        Glu Ala Leu Ser Leu Lys Asn Gln Ser Leu Ala Arg Gln Thr Asp Pro
                515             520             525
        Ser Cys Thr Ala Phe Gly Ser Phe Asn Ser Leu Gly Gly His Leu Ile
    5     530             535             540
        Val Pro Asn Ser Gly Val Ser Leu Leu Ile Pro Ala Gly Ala Ile Pro
        545             550             555             560
   10 Gln Gly Arg Val Tyr Glu Met Tyr Val Thr Val His Arg Lys Glu Thr
                565             570             575
        Met Arg Pro Pro Met Asp Asp Ser Gln Thr Leu Leu Thr Pro Val Val
                580             585             590
   15
        Ser Cys Gly Pro Pro Gly Ala Leu Leu Thr Arg Pro Val Val Leu Thr
                595             600             605
        Met His His Cys Ala Asp Pro Asn Thr Glu Asp Trp Lys Ile Leu Leu
   20     610             615             620
        Leu Ala Gly Val Gln His Pro Ser Leu Leu Ser Gly
        625             630             635
```

```
   25
        <210> 15
        <211> 28
        <212> DNA
        <213> Artificial Sequence
   30
        <220>
        <223> Description of Artificial Sequence: Forward Primer
              MF402L11I

   35 <400> 15
        atggagactt cgctcactgg tcctctttt                                    28


        <210> 16
   40 <211> 28
        <212> DNA
        <213> Artificial Sequence

        <220>
   45 <223> Description of Artificial Sequence:Reverse   Primer
              MF402L11I

        <400> 16
        cctggaggca cataaaccct agacatcc                                     28
   50

        <210> 17
        <211> 21
        <212> DNA
   55 <213> Artificial Sequence

        <220>
        <223> Description of Artificial Sequence: Forward Primer
              MF402L11II
   60
        <400> 17
        acatcctgag gtaggtggtc c                                            21


   65 <210> 18
        <211> 21
        <212> DNA
        <213> Artificial Sequence
```

- 21 -

```
        <220>
        <223> Description of Artificial Sequence:Reverse Primer
              MF402L11II
  5
        <400> 18                                                    21
        gggtctcact cattctgttg c


 10  <210> 19
     <211> 21
     <212> DNA
     <213> Artificial Sequence

 15  <220>
     <223> Description of Artificial Sequence: Forward Primer
           MF402L11III


     <400> 19                                                       21
 20  ctgtattttg actcaattgt g


     <210> 20
     <211> 21
 25  <212> DNA
     <213> Artificial Sequence


     <220>
     <223> Description of Artificial Sequence: Reverse
 30        Primer MF402L11III


     <400> 20                                                       21
     ccaaaagcct ctccttatta c


 35
     <210> 21
     <211> 28
     <212> DNA
     <213> Artificial Sequence
 40
     <220>
     <223> Description of Artificial Sequence: Forward Primer
           MF402L11IV

 45  <400> 21                                                       28
     gaatacagac acacagagac agcacctt


     <210> 22
 50  <211> 28
     <212> DNA
     <213> Artificial Sequence

     <220>
 55  <223> Description of Artificial Sequence: Reverse Primer
           MF402L11IV

     <400> 22                                                       28
     gttccttgct ccagtgaaag acataatc
 60

     <210> 23
     <211> 28
     <212> DNA
 65  <213> Artificial Sequence

     <220>
     <223> Description of Artificial Sequence: Forward Primer
```

MF402L11V

<400> 23
ctaacaccag ttcagtggaa cccattgc                                    28

<210> 24
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      MF402L11V

<400> 24
atttgatgtt catacagggt tgggggac                                    28

<210> 25
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      MF402L11VI

<400> 25
ctccacttgg actctgatga caccactg                                    28

<210> 26
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      MF402L11VI

<400> 26
catagttcac tgcagcctca acctcct                                     27

<210> 27
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      MF90A19I

<400> 27
taattatgat tagacagacc gtcctcca                                    28

<210> 28
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      MF90A19I

<400> 28

agtttactac tcagcctttg ccttcact                                       28


<210> 29
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
       MF90A19II

<400> 29
tctgccccac gtccaatcta ggtaactt                                       28


<210> 30
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
       MF90A19II

<400> 30
gatggtgtgg aggaagaggt tcaaaggt                                       28


<210> 31
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
       MF90A19III

<400> 31
aactgagaac tggaaggtag ctttggga                                       28


<210> 32
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
       MF90A19III

<400> 32
acaagagcag tcagaactat ttggccct                                       28


<210> 33
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
       MF90A19IV

<400> 33
atttgctggc tccgacagta agtattcc                                       28

```
      <210> 34
      <211> 28
      <212> DNA
      <213> Artificial Sequence
 5
      <220>
      <223> Description of Artificial Sequence: Reverse Primer
            MF90A19IV

10    <400> 34
      atgcagtgat gcttaacacc ctgtctct                              28


      <210> 35
15    <211> 28
      <212> DNA
      <213> Artificial Sequence

      <220>
20    <223> Description of Artificial Sequence: Forward Primer
            MF90A19V

      <400> 35
      cctgctctgt ctgccttgga aaagaaat                              28
25

      <210> 36
      <211> 28
      <212> DNA
30    <213> Artificial Sequence

      <220>
      <223> Description of Artificial Sequence: Reverse Primer
            MF90A19V
35
      <400> 36
      tcttggccca gacggtataa gagtccat                              28


40    <210> 37
      <211> 28
      <212> DNA
      <213> Artificial Sequence

45    <220>
      <223> Description of Artificial Sequence: Forward Primer
            MF90A19VI

      <400> 37
50    agtgcaccag taagcatgcc ttccaata                              28


      <210> 38
      <211> 28
55    <212> DNA
      <213> Artificial Sequence

      <220>
      <223> Description of Artificial Sequence: Reverse Primer
60       MF90A19VI

      <400> 38
      aagctggcaa ggagattctc aaaagtgg                              28

65
      <210> 39
      <211> 28
      <212> DNA
```

```
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
     MF90A19VII

<400> 39
accacatctg ctgaagttga ctggacct                                    28


<210> 40
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
     MF90A19VII

<400> 40
tctgggcaac atagtgaaac cctgtctc                                    28


<210> 41
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
     MF90A19VIII

<400> 41
cttgaaccta ggagacggag gttgcagt                                    28


<210> 42
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
     MF90A19VIII

<400> 42
aagcatatct ctgaccctct ggccattc                                    28


<210> 43
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
     MF90A19IX

<400> 43
gaagctgcaa tcccatcctt gtctcttt                                    28


<210> 44
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
```

- 26 -

<223> Description of Artificial Sequence: Reverse Primer
      MF90A19IX

<400> 44
tggtggtgca cacctgtaat accagcta                                    28


<210> 45
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      C4P3F

<400> 45
aggatgtcca tggttttgga                                             20


<210> 46
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      C4P3R

<400> 46
ctgtttccag cttccagagg                                             20


<210> 47
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      C4P4F

<400> 47
catggtccca aagctctgtt                                             20


<210> 48
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      C4P4R

<400> 48
tgacggaatt tcagtgcaac                                             20


<210> 49
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      C4P7F

```
<400> 49
tctgatacag gggatttggc                                          20


<210> 50
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      C4P7R

<400> 50
ttcaggtggg tgatgtgtgt                                          20


<210> 51
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      C4P8F

<400> 51
aggaaagagg ggtgctgtct                                          20


<210> 52
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      C4P8R

<400> 52
atagcaggag agtgagggca                                          20


<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward Primer
      C4P9F

<400> 53
ggcccacttt ctggttcata                                          20


<210> 54
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse Primer
      C4P9R

<400> 54
tcagccagac cagtgtgaaa                                          20
```

```
    <210> 55
    <211> 20
    <212> DNA
 5  <213> Artificial Sequence

    <220>
    <223> Description of Artificial Sequence: Forward Primer
          C15P1F
10
    <400> 55
    ggtctctgcc ctctgtcaag                                        20


15  <210> 56
    <211> 20
    <212> DNA
    <213> Artificial Sequence

20  <220>
    <223> Description of Artificial Sequence: Reverse Primer
          C15P1R

    <400> 56
25  aggcttccca cacagatgag                                        20


    <210> 57
    <211> 20
30  <212> DNA
    <213> Artificial Sequence

    <220>
    <223> Description of Artificial Sequence: Forward Primer
35        C15P2F

    <400> 57
    cactcttggc acccttaacc                                        20

40
    <210> 58
    <211> 20
    <212> DNA
    <213> Artificial Sequence
45
    <220>
    <223> Description of Artificial Sequence: Reverse Primer
          C15P2R

50  <400> 58
    tttgttctgt cctccccaac                                        20


    <210> 59
55  <211> 20
    <212> DNA
    <213> Artificial Sequence

    <220>
60  <223> Description of Artificial Sequence: Forward Primer
          C15P5F

    <400> 59
    tttcatcaaa gcatcccaca                                        20
65

    <210> 60
    <211> 20
```

```
    <212> DNA
    <213> Artificial Sequence

    <220>
5   <223> Description of Artificial Sequence: Reverse Primer
        C15P5R

    <400> 60
    tggtaattcg tgctgcagag                                    20
10

    <210> 61
    <211> 20
    <212> DNA
15  <213> Artificial Sequence

    <220>
    <223> Description of Artificial Sequence: Forward Primer
        C15P6F
20
    <400> 61
    cccaaacatt ccaacttcgt                                    20

25  <210> 62
    <211> 20
    <212> DNA
    <213> Artificial Sequence

30  <220>
    <223> Description of Artificial Sequence: Reverse Primer
        C15P6R

    <400> 62
35  tagctcaagc ctgaacccat                                    20

    <210> 63
    <211> 26
40  <212> DNA
    <213> Artificial Sequence

    <220>
    <223> Description of Artificial Sequence: Forward Primer
45      BPC4F

    <400> 63
    accctaatgc ccatttttgg ttgagg                             26
50
    <210> 64
    <211> 28
    <212> DNA
    <213> Artificial Sequence
55
    <220>
    <223> Description of Artificial Sequence: Reverse Primer
        BPC15R

60  <400> 64
    aaataccagt cctttccgaa gcctctcc                           28

    <210> 65
65  <211> 28
    <212> DNA
    <213> Artificial Sequence
```

- 30 -

```
    <220>
    <223> Description of Artificial Sequence: Forward Primer
          BPC15F

 5  <400> 65
    cgacagaacc atccaaacca agacactt                                      28


    <210> 66
10  <211> 28
    <212> DNA
    <213> Artificial Sequence

    <220>
15  <223> Description of Artificial Sequence: Reverse Primer
          BPC4R

    <400> 66
    gtgtttattg tgtcacgtgc agttgctg                                      28
20

    <210> 67
    <211> 27
    <212> DNA
25  <213> Artificial Sequence

    <220>
    <223> Description of Artificial Sequence: Forward Primer
          RORa1 5' UTR
30
    <400> 67
    ctgaaaacag aagatagagg gagtctc                                       27


35  <210> 68
    <211> 20
    <212> DNA
    <213> Artificial Sequence

40  <220>
    <223> Description of Artificial Sequence: Reverse Primer
          UNC5c 3'UTR

    <400> 68
45  atttcccctt ccagcatggt                                               20


    <210> 69
    <211> 27
50  <212> DNA
    <213> Artificial Sequence

    <220>
    <223> Description of Artificial Sequence: Forward Primer
55        AP1

    <400> 69
    ccatcctaat acgactcact atagggc                                       27

60
    <210> 70
    <211> 22
    <212> DNA
    <213> Artificial Sequence
65
    <220>
    <223> Description of Artificial Sequence: Reverse Primer
```

```
<400> 70
ctccacagat cttgcatgga at                                    22


5  <210> 71
   <211> 23
   <212> DNA
   <213> Artificial Sequence

10 <220>
   <223> Description of Artificial Sequence: Forward Primer
       AP2

   <400> 71
15 actcactata gggctcgagc ggc                                   23


   <210> 72
   <211> 23
20 <212> DNA
   <213> Artificial Sequence

   <220>
   <223> Description of Artificial Sequence: Forward Primer
25
   <400> 72
   tctgtgtttc atacccagga ggt                                   23


30 <210> 73
   <211> 23
   <212> DNA
   <213> Artificial Sequence

35 <220>
   <223> Description of Artificial Sequence: Reverse Primer

   <400> 73
   agaacacaca cccatagact gca                                   23
40

   <210> 74
   <211> 19
   <212> DNA
45 <213> Artificial Sequence

   <220>
   <223> Description of Artificial Sequence: Forward Primer

50 <400> 74
   cctgtaccgc atttggcag                                        19


   <210> 75
55 <211> 20
   <212> DNA
   <213> Artificial Sequence

   <220>
60 <223> Description of Artificial Sequence: Reverse Primer

   <400> 75
   tgcaaaccag ctccactgtg                                       20

65
```